

# A death rattle hypothesis for minority rules Beyond conceptual neatness in the weights vs. imperfections debate

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## Introduction

- ▶ Variable output can be attributed to weighted grammars or imperfections in the usage of categorical grammars
  - ▷ Regularity of variation favors weights (Labov 1969)
  - ▷ Imperfections can in principle be regular so doing without weights is another plausible way towards conceptual neatness (e.g. Pinker 1984)
- ▶ Goal of this paper:
  - ▷ Theoretical: Bring out sharply different predictions of weights and imperfections by focusing on loss of context rather than loss of weight
  - ▷ Empirical: Outline a case study of variable subject case in Icelandic that favors weights over imperfections given the Death Rattle Hypothesis
  - ▷ Weights and imperfections are not assumed to be mutually exclusive in general but in loss of a minority context scenarios – the Death Rattle Hypothesis can distinguish between them on a case-by-case basis

## The Elsewhere Condition hierarchy

- (1) Elsewhere Condition Hierarchy: A rule  $R_1$  which applies in context  $C_1$  blocks rule  $R_2$  in context  $C_2$  if  $C_1$  is a subset of  $C_2$  (Kiparsky 1973)

```
IF [+A, +B]
  THEN apply  $R_1$ 
ELSE IF [+A]
  THEN apply  $R_2$ 
ELSE
  apply  $R_{default}$ 
```

## Stochastic blocking (Yang 2002)

- ▶ Stochastic blocking: rules can apply with a probability lower than 100%
  - ▶ Any rule based grammar + **Weights**
  - ▶ Acquisition = Updating weights, which can but may not end at 100%
- (2) Stochastic blocking is compatible with the competing grammars concept familiar in historical syntax (Kroch 1989)

a) categorical grammar	b) rule loses weight	c) rule disappears
IF [+A, +B]	IF [+A, +B]	IF [+A]
THEN apply $R_1$	THEN apply $R_1$	THEN apply $R_1$
(weight $\approx$ 1.00)	(weight=0.30)	(weight $\approx$ 1.00)
ELSE IF [+A]	ELSE IF [+A]	ELSE
THEN apply $R_2$	THEN apply $R_2$	apply $R_{default}$
(weight $\approx$ 1.00)	(weight $\approx$ 1.00)	
ELSE	ELSE	
apply $R_{default}$	apply $R_{default}$	

## What happens when the context of a minority rule is lost?

- (3) Categorical but imperfect grammar: the rule simply disappears
- |                     |                     |
|---------------------|---------------------|
| a) before change    | b) after change     |
| IF [+A, +B]         | IF [+A]             |
| THEN apply $R_1$    | THEN apply $R_1$    |
| ELSE IF [+A]        | ELSE                |
| THEN apply $R_2$    | apply $R_{default}$ |
| ELSE                |                     |
| apply $R_{default}$ |                     |
- ▶ If inconsistent input leads to rule competition where weights are adjusted depending on the input – the predictions are different
  - ▶ Children of some generation do not identify the specific context [+A, +B] but get conflicting evidence because others speakers do
- (4) Some items in the specific set [+A, +B] might be demoted to per-item rules (whether we assume categorical or stochastic blocking)
- ```
IF item #512
  THEN apply  $R_1$ 
  (weight=0.30)
ELSE
  apply  $R_{default}$ 
```
- ▶ But clearly, this does not happen all the time. In fact, being saved by a per-item rule is highly correlated with token frequency, cf. massively irregular inflection of the verb *to be*, even in English
  - ▶ So what if the items in [+A, +B] have low token frequency and really need a context for the rule to survive?

## The Death Rattle

- (5) Remaining evidence of the minority rule in the input is reanalyzed as a low weight rule in the remaining and more general context [+A] thus extending it to more items at a low but fixed rate.
- |                         |                         |                         |
|-------------------------|-------------------------|-------------------------|
| a) before change        | b) during change        | c) death rattle phase   |
| IF [+A, +B]             | IF [+A, +B]             | IF [+A]                 |
| THEN apply $R_1$        | THEN apply $R_1$        | THEN apply $R_1$        |
| (weight=1.00)           | (weight=0.30)           | (weight=0.03)           |
| ELSE IF [+A]            | ELSE IF [+A]            | ELSE IF [+A]            |
| THEN apply $R_2$        | THEN apply $R_2$        | THEN apply $R_2$        |
| (weight $\approx$ 1.00) | (weight $\approx$ 1.00) | (weight $\approx$ 1.00) |
| ELSE                    | ELSE                    | ELSE                    |
| apply $R_{default}$     | apply $R_{default}$     | apply $R_{default}$     |

## Variable subject case in Icelandic

- ▶ Icelandic subjects are canonically nominative but experiencer subjects can be dative and subsets of experiencers, such as experiencers of physical discomfort, can be accusative
- (6) Mig hungrar  
Me.ACC hungers  
'I am hungry'
- ▶ From Old Icelandic up to about 1850 the hierarchy of ACC and DAT experiencers is stable and mostly categorical. From 1850 until recently the minority rule has lost weight
  - ▶ Children currently doing language acquisition have clear trouble identifying the ACC contexts.
  - ▶ Unattested in older written record but frequent in blogs is an extension of ACC case to any historically DAT experiencer verb.
- (7) a. Gaavuuuuuð, mig leiðist óendanlega mikið.  
Gooooo, me.ACC is bored infinitely much  
'God, I am infinitely bored!'
- b. Mig líkar litirnir.  
Me.ACC likes the.colors  
'I like the colors'
- ▶ Erlingsdóttir's elicited production experiment (2010) shows that current 6 year olds do not produce ACC subjects at a significantly different rate in the formerly distinct ACC and DAT contexts (Fischer:  $p=0.11$ ). The difference is not even remotely significant if the most token frequent experiencer verbs are excluded (Fischer:  $p=0.37$ ).

|                                     |                         |
|-------------------------------------|-------------------------|
| IF [+experiencer, +phys.discomfort] | IF [+experiencer]       |
| THEN apply ACC                      | THEN apply ACC          |
| (weight $\approx$ 0.30)             | (weight=0.03)           |
| ELSE IF [+experiencer]              | ELSE IF [+experiencer]  |
| THEN apply DAT                      | THEN apply DAT          |
| (weight $\approx$ 1.00)             | (weight $\approx$ 1.00) |
| ELSE                                | ELSE                    |
| apply $R_{default}$                 | apply $R_{default}$     |

- ▶ This is expected, given the death rattle hypothesis and weighted rules, but a complete mystery under an imperfections view of variability

## References

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